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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,217	06/24/2003	Geoff W. Taylor	OPE-024	2252
36822	7590	07/12/2005		
GORDON & JACOBSON, P.C. 60 LONG RIDGE ROAD SUITE 407 STAMFORD, CT 06902			EXAMINER PAK, SUNG H	
			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/602,217

Applicant(s)

TAYLOR ET AL.

Examiner

Sung H. Pak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 33-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Applicants' response filed 4/13/2005 has been entered. All pending claims have been carefully reconsidered in view of the response. Please refer to Response to Arguments for details.

#### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 33, 34, 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yap et al (US 6,781,533) in view of Taylor (US 6,031,243).

Yap discloses a sigma delta analog to digital converter (ADC) comprising: an integrating stage comprising a resistor, gain amplifier, a feedback capacitor (Fig. 5, Fig. 6A, column 3 lines 23-41); a device for performing analog to digital conversion and electrical to optical conversion of the result of the analog to digital conversion (Fig. 5); a device for performing digital to analog

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conversion (Fig. 5); a decimation filter operably coupled (Fig. 5); sigma delta converter formed from a quantum well channel device structure (Fig. 6c, column 8 lines 1-25).

However, Yap does not explicitly state the gain amplifier device and analog-to-digital, electrical-to-optical converters are heterojunction thyristor devices. Nevertheless the use of thyristor devices as analog-to-digital, electro-optic components are well known and common in the art, for example, as taught by Taylor (Figs. 1-3; abstract; column 13-14). Thyristors are advantageously used in the art to provide reliable, precisely controlled electro optic component with high accuracy. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yap device to use thyristor devices.

Claims 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yap et al (US 6,781,533) in view of Taylor (US 6,031,243) as applied to claims above, and further in view of Hellberg (US 6,094,458).

Yap, in view of Taylor, renders all the claimed limitations obvious, as discussed above, except it does not explicitly teach the use of a third device that operate in response to a sampling clock signal supplied to synchronize electro optic converter.

Hellberg, on the other hand, explicitly teaches the use of a third device that operate in response to a sampling clock signal supplied to perform synchronization (Fig. 5, Fig. 6, Fig. 8). Such device is considered advantageous and desirable because it enhances the efficiency of the sigma delta converter. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yap device to have a device that operate in response to a sampling clock signal to perform synchronization.

*Response to Arguments*

Starting on page 5 of the applicants' response, it is argued, "the Examiner has failed to establish a prima facie case of obviousness." (page 5, last paragraph) The examiner respectfully disagrees.

First, as applied above, there is a clear motivation, in the knowledge generally available to one of ordinary skill in the art, to modify and combine the reference teachings. Heterojunction thyristor devices have been commonly used in the art and the advantage of using such devices is well established in the art as well. Second, there is a reasonable expectation of success since none of the applied references teach away from each other. Third, prior art references, as applied above, teach all the claimed limitations.

As discussed, Yap reference discloses a sigma-delta converter with all the limitations set forth in the claims, except it does not explicitly teach that its gain amplifier and analog-to-digital electro optic element are made of heterojunction thyristors. On the other hand, the use of heterojunction thyristors to provide gain amplification and analog-to-digital electro optic conversion is well known in the art as taught by Taylor reference. Since the advantage of using thyristor device is generally known and available to one of ordinary skill in the art, and there is a reasonable expectation of success of combining the teachings of these references, the claimed limitations are obvious. Therefore, the claim rejection is proper.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak  
Patent Examiner  
Art Unit 2874

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